PHENIX
PROCEDURE PREPARATION GUIDELINES

procedure name

PHENIX Procedure No. PP-2.5.6.1-01

Revision: A **Date: 9/28/2012**

Hand Processed Changes

HPC No.	Date	Page Nos.	Initials

- *Typo: Under 6.1, "PHENIX Awareness" should be written as "PHENIX Awareness Training"*
- *Typo: Under 6.3, "PHENIX Configuration Control" should be written as "PHENIX Configuration Management"*

Approvals

PHENIX Engineering

Date 9/27/12

PHENIX Work Control

Date 9/27/12

PHENIX Safety

Date 9-27-12

PHENIX Management

Date 9/28/2012

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REVISION CONTROL SHEET

LETTER	DESCRIPTION	DATE	AUTHOR	APPROVED BY	CURRENT OVERSIGHT
A	Original Issue.	9/28/2012	D. Lynch	D. Lynch, P Giannotti, R Pisani, E. O'Brien	D. Lynch

Introduction

The purpose of this document is to provide a guideline to the creation, maintenance, dissemination and control of procedural documents which define, describe, codify and/or illustrate the manner in which PHENIX experiment operations are conducted. In particular, procedural documents provide an accessible source for reference information describing proven, tested and verified methods, techniques, courses of action, etc., thus allowing acquired skills to be shared among appropriately qualified PHENIX participants.

This document will describe under which circumstances creation, modification and deletion of a controlled procedure are appropriate (or not appropriate), general description of the expected content and format for a controlled PHENIX procedure, source and revision control and the unique identification system for PHENIX.

The necessity for this document comes from the nature of the PHENIX Experiment itself as a large collaborative effort of scientists, engineers and technicians from around the world working together on an extremely complex apparatus, which occupies a distinct and important space within the larger Relativistic Heavy Ion Collider (RHIC) which in turn resides in the still larger entity of Brookhaven National Laboratory (BNL). Operating at this intersection of entities there needs to be clearly defined scopes of influence at each of these levels. At the BNL level, PHENIX operations are governed by the SBMS which describes conduct of operations on a somewhat generic level. The SBMS recognizes that "one size fits all" procedures are impractical and overly burdensome and provides great latitude for customizing configuration management at the organizational level. On the closer level of RHIC, conduct of operations are governed by the Collider Accelerator Department (CAD) Operating Procedures Manual (OPM). The CAD OPM is designed to meet the more generic requirements of the SBMS with CAD specific procedures. At this level CAD OPM provides for strict configuration control of permanent buildings, infrastructure, and any other factors which if appropriate procedures are not implemented as required could trigger consequences that break the safety envelope of the RHIC accelerator, affect the safety of employees, visitors, contractors, or experimenters, have and adverse impact on the environment or CAD operations.

At the PHENIX level, all SBMS requirements flow down as do the requirements of the CAD OPM. There are functions specific to the PHENIX Experiment which are not adequately defined in the requirements thus flowed down, and in those cases the need for PHENIX specific procedures arises.

This document describes how such need is to be identified, evaluated and addressed.

1. Responsibilities

The PHENIX staff and all PHENIX collaborators shall apply this document when determining the appropriate means to guide work processes undertaken as part of construction, operation, maintenance, upgrade and termination of the PHENIX experiment and all of its subsystems. In addition, the PHENIX chief engineer, PHENIX project

engineers and Work Control Coordinators (WCC's) shall be responsible for assuring that all such work processes are in compliance with all applicable requirements of the current issue of the PHENIX Work Planning procedure, PHENIX document # PP-2.5.6.1-02.

The PHENIX Operations Manager shall appoint the following from among the PHENIX engineering and technical support staff:

- Work Control Coordinators (WCC's) responsible for assuring that work planning follows the requirements of applicable BNL SBMS, Physics department, Collider Accelerator department and PHENIX work control requirements

- PHENIX Safety Officer – responsible for assuring that all PHENIX safety systems and work control documents and procedures meet all applicable safety requirements

- PHENIX Controlled Documents Manager – responsible for maintaining document control for all PHENIX internally controlled documents, including assuring appropriate revision control, document approvals, distribution of copies of controlled documents, security and backup of all controlled document originals.

- PHENIX Engineering Web Master – responsible for all aspects of the PHENIX engineering web pages (accessible from the PHENIX internal web site), including posting and updating all controlled procedures on the web for easy access by PHENIX collaborators.

2. Prerequisites

None.

3. Precautions

None.

4. Process by which Procedures are created and managed

As the need arises to perform work in support of construction, assembly, installation, testing, maintenance, upgrade, or termination of buildings, facilities services and or equipment related to the PHENIX experiment, PHENIX WCC's must assess the work to be done in accordance with the PHENIX Work Planning procedure, the latest version of PHENIX document # PP-2.5.6.1-02. From that planning process one of the following might be determined:

- The work is straightforward and does not require a written documented procedure (i.e. the work is worker planned work and conforms to the requirements of the PHENIX Awareness training - see latest version of PHENIX document # PP-2.5.5.6-09.)

- The work requires a detailed description of the work to be performed, usually including a step by step procedure to be followed which is unique to the current work being performed.
- Similar or identical work has been performed previously and a controlled procedure has previously been written which fully describes the work.
- The work requires a detailed description of the work to be performed, usually including a step by step procedure to be followed which can be expected to be repeated in the future.

In the first case, worker planned work, no written procedure is required. The nature of this work is such that properly skilled and trained personnel can complete the work without a written description. All PHENIX personnel who have been taken PHENIX Awareness training are authorized to make the determination that the work falls into this category. In the event that there is any doubt, a PHENIX WCC shall be consulted to determine whether or not the work falls into this category.

Unique work requiring a documented detailed description, such description shall be generated as part of PHENIX work permit by a PHENIX WCC. Such permit and procedure shall be reviewed and approved in accordance with the PHENIX Work Planning procedure, the latest version of PHENIX document # PP-2.5.6.1-02

When the work is similar to previously performed work for which a controlled procedure or procedures exist, a PHENIX WCC shall generate a work permit wherein the procedure or procedures are referenced. Such work permit may also include a unique procedure which calls out one or more controlled procedures. Should the controlled procedure require some modification to perform the current work, the PHENIX WCC shall determine whether such accommodation can be made by procedural description within the work permit (thus not changing the controlled procedure), revision to the controlled procedure (only if it is assured that revision will not change the controlled procedure for other work for which it has been, is or will be intended), or creation of a new controlled procedure which uses the existing procedure as a template and/or a reference. The work permit generated for this work shall be reviewed and approved in accordance with the PHENIX Work Planning procedure, the latest version of PHENIX document # PP-2.5.6.1-02

For work which is expected to be repeated in the future, including the case described above where an existing procedure would need to be modified to an extent that it would no longer serve its original intended purpose, a controlled work procedure should be generated as indicated in the following sections of this document. After a new controlled procedure has been generated and approved, a PHENIX WCC may then generate a work permit as described in the previous case.

4.1 Controlled Procedures

4.1.1 Non PHENIX Internal Controlled Procedures

Controlled procedures generated and controlled by any entities other than the PHENIX engineering group may be used for work at PHENIX when deemed appropriate by PHENIX WCC's. The format of these procedures is the responsibility of the entity creating the procedure. In such cases, the controlled procedure used shall be incorporated into a PHENIX work permit as appropriate for the current work only. Each time such work recurs in the future, the procedure shall be completely reevaluated to assure that the then current version has not been altered to an extent that it is no longer appropriate for the work. In such cases the PHENIX WCC shall determine the appropriate actions to take in accordance with paragraph 4 above.

4.1.2 PHENIX Internal Controlled Procedures

The PHENIX engineering group shall be responsible for generating, maintaining, revising, distributing and terminating PHENIX internal controlled procedures. Maintenance and security of these documents shall be the responsibility of the PHENIX Documentation Control Manager.

4.1.2.1 Format

PHENIX Controlled Procedures shall be formatted as described in paragraph 5 of this document.

4.1.2.2 Approval

PHENIX Controlled procedures shall be reviewed by the PHENIX Safety Officer or his designee and at least 2 other PHENIX WCC's. If after review it is deemed necessary in order to comply with BNL, PHYSICS or CAD policies, additional approvals as necessary shall be obtained. All approving persons shall sign the cover page.

4.1.2.3 Document Control and Revision

Whenever a procedure is revised it shall be reviewed by the PHENIX Safety Officer or his designee and at least 2 other PHENIX WCC's. If after review it is deemed necessary in order to comply with BNL, PHYSICS or CAD policies, additional approvals as necessary shall be obtained. All approving persons shall sign the cover page of the revised procedure.

The cover page shall indicate the current revision level and the date of the revision. The nature, rational an other appropriate information shall be indicated on the revision control sheet.

Controlled Procedures shall have a revision letter that starts at "A"

on the cover page in the indicated space. The revision letter shall appear on all other pages as a part of the procedure number.

The letters I, O, Q, S, X and Z shall not be used. When and if revisions are numerous enough to exhaust the alphabet, the next revision shall be "AA" then "AB", etc.

All controlled procedures shall be reviewed by the PHENIX Safety Officer or his designee and at least 2 other PHENIX WCC's at least once every 3 years to assure that the procedure is still current. At that time the procedure shall either be revised as necessary, rendered inactive, or retained as is. If retained as is, the revision level shall be increased by one, the date changed to the current date and a note placed in the list of revisions page to indicate that the procedure has been reviewed and retained unchanged. All reviewers shall sign and date the new cover page of the revised procedure.

4.1.2.4 Distribution

Original signed copies of each procedure shall be securely maintained by the PHENIX Controlled Documents Manager. Printed or electronic copies (pdf format) may be requested from the PHENIX Controlled Documents Manager as required. Pdf copies may also be downloaded from the PHENIX Engineering Web. The revision level of documents on the web should be verified prior to using them.

4.1.2.5 Document Termination

Whenever a controlled procedure becomes obsolete, for whatever reason, The PHENIX Controlled documents Manager shall review the document with at the PHENIX Safety Officer and at least one other PHENIX WCC to determine if that procedure should be updated, superceded by another document or simply de-activated. If updated the procedure should be appropriately revised and thus rendered no longer obsolete. If superceded or simply de-activated, the date of de-activation shall be noted on the list of revisions page.

Originals of the de-activated procedure shall be placed in an inactive file and shall not be available for any work. Pdf copies on the web shall be moved from the active directory to the inactive directory. Copies of inactive procedures may not be used for any work, but may still be retrieved for reference purposes via the

inactive procedures link in the PHENIX engineering web.

Should the need arise to re-activate an inactive procedure, the procedure shall be reviewed and revised as and if necessary, the changes (or simply a notation that the procedure has been re-activated if no actual revisions are necessary) shall be made on the list of revisions page, the revision level shall be increased by one, the date and revision level shall be updated on the cover page, and all reviewers shall sign and date the new cover page of the re-activated procedure.

5. Documentation

Controlled PHENIX procedures shall be assigned a number in accordance with attachment 1 of this document by PHENIX documentation control manager, as assigned by the PHENIX chief engineer (see the current issue of PHENIX Documentation Control Procedure, PHENIX document # PP-2.5.6.1-04.) Controlled PHENIX procedures may use this document as a reference for content outline, though this not mandatory. Title page format and revision control sheet shall be incorporated in all PHENIX controlled procedures. All pages shall be numbered and the procedure number and current revision level shall appear on all pages. Legacy procedures (i.e. procedures written prior to the initial release of this document) shall be brought into compliance with this document at the next revision opportunity.

6. References

6.1 PHENIX Awareness Document # PP-2.5.5.6-09
6.2 PHENIX Work Planning Document # PP-2.5.6.1-02
6.3 PHENIX Configuration Control Document # PP-2.5.6.1-03
6.4 PHENIX Documentation Control Document # PP-2.5.6.1-04
6.5 C-A OPM 2.42 Liaison Engineer, Physicist; Project Engineer and Physicist; Liaison Scientist: Roles and Responsibilities for Modifications
6.6 BNL SBMS Management System: Configuration Management

7. Attachments

7.1 Attachment 1: PHENIX Procedure numbering system

ATTACHMENT 1: PHENIX PROCEDURES

PP2.5.1.0 MAGNET SYSTEMS ***BOOK 1***
- 2.5.1.1 OUTER COIL
- 2.5.1.2 INNER COIL
- 2.5.1.3 CENTRAL MAGNET SYSTEMS
- 2.5.1.4 MUON COIL
- 2.5.1.5 MUON MAGNET STEEL
- 2.5.1.6 MUON ID STEEL

PP-2.5.2.0 DETECTOR SYSTEMS
- 2.5.2.1 MVD
- 2.5.2.2 BBD
- 2.5.2.3 HBD
- 2.5.2.4 DC
- 2.5.2.5 PC
- 2.5.2.6 TEC
- 2.5.2.7 RICH
- 2.5.2.8 TOF
- 2.5.2.9 EMCal (PbSc)
- 2.5.2.10 EMCal (PbGl)
- 2.5.2.11 EMCal (CsI)
- 2.5.2.12 MUON Tr
- 2.5.2.13 MUON Id
- 2.5.2.14 COMMON OPS

PP-2.5.3.0 DETECTOR SYSTEMS (FEE) ***BOOK 2***
- 2.5.3.1 MVD
- 2.5.3.2 BBD
- 2.5.3.3 HBD
- 2.5.3.4 DC
- 2.5.3.5 PC
- 2.5.3.6 TEC
- 2.5.3.7 RICH
- 2.5.3.8 TOF
- 2.5.3.9 EMCal (PbSc)
- 2.5.3.10 EMCal (PbGl)
- 2.5.3.11 EMCal (CsI)
- 2.5.3.12 MUON Tr
- 2.5.3.13 MUON Id
- 2.5.3.14 COMMON FEE SYSTEM WORK

PP-2.5.4.0 DAQ/TRIGGER/COMPUTING
- 2.5.4.1 DATA COLLECTION MODULES
- 2.5.4.2 SUBEVENT TRANSFER BUFFERS
- 2.5.4.3 EVENT BUILDER
- 2.5.4.4 LEVEL 1 TRIGGER
- 2.5.4.5 LEVEL 2 TRIGGER
- 2.5.4.6 LEVEL 3 TRIGGER
- 2.5.4.7 ROUTING LAYER
- 2.5.4.8 MASTER TIMING & CONTROL SYSTEM
- 2.5.4.9 ON-LINE COMPUTING SYSTEM
- 2.5.4.10 SIMULATION COMPUTING
- 2.5.4.11 OFF-LINE COMPUTING
- 2.5.4.12 COMMON COMPUTING
- 2.5.4.13 COMMON DAQ

PP-2.5.5.0 SYSTEMS ENGINEERING & INTEGRATION
- 2.5.5.1 DETECTOR CARRIAGES
- 2.5.5.2 FACILITIES
- 2.5.5.3 INTEGRATION
- 2.5.5.4 INSTALLATION
- 2.5.5.5 DETECTOR TEST & COMMISSIONING
- 2.5.5.6 SAFETY & ENVIRONMENTAL PROTECTION

PP-2.5.6.0 PROJECT MANAGEMENT
- 2.5.6.1 QUALITY ASSURANCE
- 2.5.6.2 SITE MANAGEMENT
- 2.5.6.3 BUDGET TRACKING & REPORTING